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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ouimet  
Serial No.: 10/633,249  
Filed: 31 July 2003  
For: STRATEGIC PLANNING AND OPTIMIZATION SYSTEM

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Respectfully submitted,

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PTO/SB/17 (12-04v2)

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# FEE TRANSMITTAL

## For FY 2005

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

250.00

**Complete if Known**

Application Number	10/633,249
Filing Date	31 July 2003
First Named Inventor	Ouimet
Examiner Name	Cosimano
Art Unit	3639
Attorney Docket No.	2297-050CON

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Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	_____
Design	200	100	100	50	130	65	_____
Plant	200	100	300	150	160	80	_____
Reissue	300	150	500	250	600	300	_____
Provisional	200	100	0	0	0	0	_____

**2. EXCESS CLAIM FEES****Fee Description**

	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
_____ - 20 or HP = _____	x _____	= _____	

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
_____ - 3 or HP = _____	x _____	= _____	

HP = highest number of independent claims paid for, if greater than 3.

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
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In re the Application of: <b>Kenneth L. Ouimet</b>	Date: <b>29 December 2005</b>
Serial Number: <b>10/633,249</b>	Group Art Unit: <b>3639</b>
Filed: <b>31 July 2003</b>	Examiner: <b>Edward R. Cosimano</b>
Title: <b>"Strategic Planning And Optimization System"</b>	Atty. Docket No.: <b>2297-050CON</b>

Assistant Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

## **APPELLANT'S BRIEF**

Dear Sir:

This Brief is filed pursuant to a Notice of Appeal mailed on 8 November 2005 in the matter of the above-identified application.

01/04/2006 HGUTEMA1 00000101 10633249

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**Real Party in Interest**

KhiMetrics, Incorporated is the real party in interest and the assignee of this application.

### **Related Appeals and Interferences**

Appellant is aware of no related appeals, interference, and/or other proceedings relevant to this discussion.

### **Status of Claims**

Claims 1 and 3-7, of which claim 1 is an independent claim, are presented herein. Claims 1 and 3-7 have been rejected, and claims 1 and 3-7 are on appeal.

Appendix A provides a clean copy of all claims on appeal.

Claims 1 and 3-7 stand rejected under 35 U.S.C. §112, second paragraph, alleged as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 3-7 stand rejected under 35 U.S.C. §101 because the invention as claimed is alleged to be directed to non-statutory subject matter.

**Status of Amendments**

No amendments have been filed subsequent to the rejections set forth a non-final Office Action, dated 11 August 2005.

### **Summary of Claimed Subject Matter**

Appendix B provides copies of drawing sheets 1-15 containing FIGs. 1-16, which are discussed herein. The following reference to paragraph numbers in the specification relates the paragraph numbering of the replacement specification filed in connection with a first Amendment, dated 2 August 2005.

The present invention pertains to a computer program, in an enterprise planning model, residing in memory and executable by a processor that enables visualization of an effect of a strategic constraint on a primary goal of an enterprise.

FIG. 3 shows a computing system that includes among other components, a processor 105 and a memory 104 for storing program instructions. These instructions executed on the processor 105 include a Constraint Mapping routine 112, a Preprocessing routine 113, and a Scenario Analysis route 114. Memory 104 can further store data lists 115 and a table portion 116, which may in turn include a Constraint Overview table, an Optimum Value table and/or a Target Value table stored therein (paragraph [0073]).

FIG. 6 illustrates a goal selection routine, and FIG. 7 shows a menu that may be presented to a user to prompt the user through the Goal Selection routine (paragraph [0097]). The user selects the primary goal of the enterprise planning model to be realized. The primary goal is subject to actual physical limitations/constraints of the enterprise planning model (paragraph [0079]). The primary objective or goal may be profit, overall revenue, market share, risk-adjusted income,



and/or other user defined primary goals. The primary objective contains or subsumes decision variables which must be optimized to attain the objective (paragraph [0026]). The primary goal is represented by a primary objective function,  $\Pi$ , and the primary objective function depends upon a set of operational (i.e., decision) variables,  $\{X_i\}$  (paragraph [0081]).

Through the prompts provided in the menu of FIG. 7, the user can also select a strategic constraint, also known as a strategic objective or an auxiliary goal. This constraint represents some global, large-scale objective that is not included in the primary objective function (paragraph [0084]). In contrast to the primary goal, there are no direct physical constraints on the strategic constraint (paragraph [0079]). Strategic constraints, or objectives, are not fixed or known in advance. They depend on a manager's judgment; they represent strategic decisions where the manager must consider one or more tradeoffs that the manager may choose to take, with the idea that the tradeoff will actually produce a benefit in the long run (paragraph [0027]). As further shown in FIG. 7, the strategic constraint is represented by a constraint function,  $\phi$ , and the constraint function depends upon a subset of operational variables (paragraph [0084]).

Next, an effective objective function,  $\Pi_{\text{eff}}$ , is constructed by combining the primary objective function,  $\Pi$ , and the constraint function,  $\phi$  (paragraphs [0110] through [0111]). In particular, the effective objective function is constructed by taking the primary objective function and subtracting the constraint function as weighted by a weighting factor/value,  $\psi$ . The variable  $\psi$  takes on values between  $\psi^{\min}$  and  $\psi^{\max}$  and is

incremented in stepwise increments (paragraphs [0106] through [0108])). The weighting value affects the extent to which the strategic constraint/objective will affect the primary goal/objective (paragraph [0106])).

The effective objective function,  $\Pi_{\text{eff}}$ , is then optimized (and in this exemplary embodiment, maximized) with respect to all of the operational variables,  $\{X_i\}$ , for one of the weighting factors  $\psi$ , for example, beginning with  $\psi^{\min}$ , for the constraint function (paragraphs [0113] through [0115])). The variable  $\psi$  serves the purpose of being a reward or penalty. If the value of  $\psi$  is large and positive, then the strategic constraint acts as a penalty, and the optimization will be skewed toward a solution that results in a lower numerical value of the constraint function. If the value of  $\psi$  is large and negative, then the strategic constraint acts as a reward, and the optimization will be skewed towards a solution that results in a higher numerical value of the constraint function. And if the value of  $\psi$  is zero, the effect of the strategic constraint function is not felt at all, and the optimization of the effective objective function amounts to an unconstrained optimization of the primary goal.

The result of the optimization is the maximized value of the effective objective function,  $\Pi_{\text{eff}}$ , and the resulting values for the independent/operational variables,  $\{X_i\}$ . The values of the primary objective function,  $\Pi$ , and the constraint function,  $\phi$ , are determined from these variables,  $\{X_i\}$ , and are stored in a Constraint Overview table in the table portion 116 of memory 104, as shown in FIG. 9, in association with the particular

weighting factor,  $\psi$ . This procedure is repeated for each of the next incremental values of the weighting factor,  $\psi$ , until the maximum weighting factor,  $\psi^{\max}$ , is reached. In other words, the procedure is repeated over a selected range of weighting factors from  $\psi^{\min}$  to  $\psi^{\max}$  (paragraph [0118]).

The information stored in the Constraint Overview table provides a concise summary of the behavior of the target market - i.e., a summary of the effect that the strategic objective/constraint will have on the primary goal. The data from the table may be used as input to a visualization routine or package. Thus, the user can be provided with an intuitive, graphical view of the dependence of the primary goal on the target value of the strategic constraint/objective, as illustrated in FIGs. 1 and 16 (paragraph [0119]).

## **Grounds of Rejection to Be Reviewed on Appeal**

The 11 August 2005 Office Action rejected claims 1 and 3-7.

The following two grounds of rejection are presented for review:

- 1: Whether claims 1 and 3-7 are indefinite under 35 U.S.C. §112, second paragraph.
- 2: Whether claims 1 and 3-7 are unpatentable under 35 U.S.C. §101.

The 11 August 2005 Office Action objected to the disclosure because of alleged informalities.

The following objection to the specification is presented for review:

- 1: Whether the disclosure includes informalities that require correction.

## **ARGUMENTS**

### **Preface to Arguments**

Claims 1 and 3-7 have been four times rejected.

In a first Office Action, dated 12 May 2004 (hereinafter "first Office Action"), originally filed claims 1-8 were rejected under 35 U.S.C. §112, second paragraph. In addition, claims 1-8 were rejected under 35 U.S.C. §101. Claims 1-8 were further rejected under 35 U.S.C. §102(b) as being anticipated by O'Brien, WO 95/26007, and claims 1-8 were rejected under 35 U.S.C. §102(e) as being anticipated by Kosiba et al., U.S. Patent Publication No. 2002/0184069 (hereinafter Kosiba).

In a first Amendment, dated 2 August 2004 (hereinafter "first Amendment"), Appellant canceled claim 8, amended claims 1, 3, 5, and 6, added claim 9, and retained claims 2, 4, and 7 as originally submitted. Arguments were presented in the first Amendment addressing the rejections presented in the first Office Action.

In a second Office Action, dated 16 November 2004 (hereinafter "second Office Action"), the rejections presented in the first Office Action were largely repeated.

In a second Amendment, dated 1 February 2005 (hereinafter "second Amendment"), Appellant cancelled claim 9 and amended claims 1-7. Further arguments were presented in the second Amendment addressing the rejections presented in the second Office Action.

In response to the second Amendment, a third, and final, Office Action, dated 9 May 2005 (hereinafter "Final Office Action"), indicated that rejections of claims 1-7 under 35 U.S.C. §112, second paragraph, and 35 U.S.C. §101 were overcome. However, the rejection of claims 1-7 under 35 U.S.C. §102(b) as being anticipated by O'Brien and under 35 U.S.C. §102(e) as being anticipated by Kosiba were maintained.

An Amendment After Final Rejection, dated 20 July 2005, was filed in response to the Final Office Action. In the Amendment After Final Rejection, Appellant amended claims 1, 3, 5, and 6, retained claims 4 and 7, as previously presented, and canceled claim 2.

Appellant argued in the Amendment After Final Rejection that O'Brien fails to anticipate Appellant's invention of amended claim 1. In addition, claims 1 and 3-7 Appellant provided clear and unambiguous evidence that the claimed subject matter predates Kosiba. Therefore, Kosiba was not prior art to any claim pending in the present application.

A fourth, non-final, Office Action, dated 11 August 2005 (hereinafter "fourth Office Action"), responds to the Amendment After Final Rejection. The fourth Office Action apparently concurs that Kosiba is not prior art, since Kosiba is no longer cited as grounds for rejection. In addition, the fourth Office Action expressly states that the claimed invention is allowable over O'Brien. Now, however, the fourth Office Action establishes new grounds of rejection of claims 1 and 3-7 under 35 U.S.C. §112, second paragraph, and under 35 U.S.C. §101.

A summary of the rejections set forth in the four Office Actions is presented in tabular form below, where an "X" indicates that the particular rejection was included in the corresponding Office Action, and a blank space indicates that the particular rejection was overcome in the preceding Amendment.

Office Action	112, 2 <sup>ND</sup>	101	102 (b) (O'Brien)	102 (e) (Kosiba)
1 <sup>st</sup>	X	X	X	X
2 <sup>nd</sup>	X	X	X	X
3 <sup>rd</sup> , Final			X	X
4 <sup>th</sup> , Non-final	X	X		

In general, Appellant believes the rejections of claims 1 and 3-7 under 35 U.S.C. §112, second paragraph, and 35 U.S.C. §101 were overcome in response to arguments presented in the second Amendment because these rejections are not repeated in the third Office Action. In the Amendment After Final Rejection, responsive to the third Office Action, Appellant amended claim 1 to include the weighting factor limitation previously recited in dependent claim 6. Claim 3 was amended to correspond with the modifications to claim 1 and in response to the cancellation of claim 2. Similarly, claims 5 and 6 were amended to correspond with the modifications to independent claim 1. Since the subject matter of claims 1 and 3-7 in the Amendment After Final Rejection did not substantively change from that presented in the prior second Amendment, Appellant believes that it was improper to reconsider and even reject claims 1 and 3-7 under 35 U.S.C. §112, second paragraph, and 35 U.S.C. §101 in the fourth Office Action. Rather, only the rejection of claims 1 and 3-7 under the provisions of 35 U.S.C. §102 in view of each of O'Brien and Kosiba should have been considered.

**Grounds of Rejection 1 -- Claims 1 and 3-7 as being indefinite**

**Independent Claim 1:**

Regarding claim 1, the fourth Office Action to this application makes four assertions, each of which will be discussed below.

Assertion A): How the selecting and representing operations of claim 1 are related to the "enterprise planning model" recited as the utility on the claimed invention in the preamble or to the function of managing the enterprise, as recited in the last two lines of claim 1. The fourth Office Action asserts that the language of the selecting and representing operations does not require that either (1) the "set of operational variables" for which the "primary objective function" is dependent or (2) the "subset of the operational variables" for which the "constraint function" is dependent be tied to the operational variables of the enterprise that is being modeled and hence would not produce a meaningful result that may be used as a planning model to manage an enterprise.

Well-established patent practice dictates that a claim is not required to enable one of ordinary skill to make and use the invention to be considered definite under 35 U.S.C. §112, second paragraph. Rather, the specification is required to describe the invention "in such detail as to enable a person skilled in the most relevant art to make and use it" (In re Naquin, 158 USPQ 317, 319 (C.C.P.A. 1968)).



As best understood, the Office Action assessment of the claims indicates that the Examiner fails to recognize interrelationships between the various elements and operations of the claims, and desires the addition of further limitations to the claims so as to add more precision to them. However, the Examiner should not reject claims if another mode of expression selected by Applicant satisfies the statutory requirement (Manual of Patent Examining Procedure (MPEP) §2173.02, Rev. 2, May 2004). In this case, Appellant believes that the claim language of independent claim 1 indeed satisfies the threshold requirements of clarity and precision.

As further stated in the MPEP, §2173.02:

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

As set forth in the above-listed guideline, when the claims read in light of the supporting specification reasonably apprise one skilled in the art of the use and scope of the invention, and the language of the claims circumscribe the subject matter with a reasonable degree of clarity and particularity, then the claims are definite under U.S.C. §112, second paragraph.

As set forth in independent claim 1, the present invention is a computer program, in an enterprise planning model, whose utility enables visualization of an effect of a strategic constraint on a primary goal of an enterprise such that effects of the strategic constraint on the primary goal can be readily perceived by a user to manage the enterprise. Independent claim 1 establishes a relationship between the strategic constraint, a primary goal, and an enterprise in the preamble of the claim by the phrase "said computer program enabling visualization of an effect of a strategic constraint on a primary goal of an enterprise." One skilled in the art can readily interpret that phrase as a relationship in which an enterprise has a primary goal, and that primary goal can be affected by a strategic constraint. Moreover, this relationship is defined within the confines of a computer program in an enterprise planning model that models an enterprise. Thus, the selecting and representing operations are related to the enterprise planning model, and indeed, form part of the enterprise planning model.

It should be noted that regarding the selecting operation of independent claim 1, the primary objective function (which represents the primary goal of the enterprise) depends upon a set of operational variables. Accordingly, the primary goal, primary objective function, and set of operational variables are clearly interrelated. Support for this limitation can be found in Appellant's specification at paragraphs [0081] and [0082]. In addition, each of the operational variables of the set of operational variables represents a single operational decision that the user seeks to optimize in order to reach the primary goal (paragraph [0031]).

Similarly, it should be noted that regarding the representing operation of independent claim 1, the constraint function (which represents the strategic constraint) depends upon a subset of operational variables. Accordingly, the strategic constraint, strategic objective function, and subset of operational variables are also clearly interrelated. In addition, since the subset of operational variables is a subset (i.e., a set whose members are members of another set) of the set of operational variables, the two are interrelated. Support for this limitation can be found in Appellant's specification at paragraphs [0084] through [0086].

The above presented discussion establishes that the set and subset of operational variables for the primary objective function (representing a primary goal of an enterprise) and a constraint function (representing a strategic constraint that can affect the primary goal of the enterprise) are indeed interrelated, and this teaching is found in Appellant's specification. Moreover, due to the established relationship, the operational variables of the primary objective function and the constraint function correlate directly with (i.e., they are) the "operational variables" of the enterprise. Solution through the optimizing operation of claim 1 can thus produce a meaningful result that can be used to manage an enterprise.

Assertion B): How the optimizing operation of claim 1 would either optimize (1) the "effective objective function" or (2) the "operating decisions for the operational variables". The fourth Office Action asserts that the primary objective function,  $\Pi$ , is disclosed as a constant that equals:

$$\Pi = \sum_i Q_i (P_i - C_i)$$

and the constraint function,  $\phi$ , is disclosed as a constant that equals:

$$\phi = \sum_i Q_i P_i$$

The fourth Office Action arrives at this conclusion by erroneously presuming that the variables  $Q$ ,  $P$ , and  $C$  for any item "i" do not vary. There is no teaching or suggestion within Appellant's specification that these variables do not vary for any item "i". To the contrary, in the example functions shown above and presented in the specification, the primary objective function,  $\Pi$ , depends upon a set of variables  $\{X_i\}$ , each of which represent a single operational decision (paragraph [0081] and [0082]). In the primary objective function presented above, the variables  $\{X_i\}$  would be the set of all prices  $\{P_i\}$ . The primary goal may be defined by any model that attempts to optimize many operational decisions, i.e., those decisions that occur on a lower level. As a result of the optimization, optimal values for each of the operational variables  $\{X_i\}$  is obtained. Since the operational/decision variables  $\{X_i\}$  establish a set of all prices  $\{P_i\}$  that are variable in the primary objective function,  $\Pi$ , it follows that the set of all prices,  $\{P_i\}$ , is also variable in the constraint function,  $\phi$ . The optimal values of the operational/decision variables  $\{X_i\}$  represent a set of operational decisions that should achieve the primary objective and the strategic objective.

Since the primary objective function and the constraint function are not constants, the value of the effective objective

function would not be a straight line with the difference being solely dependent on the weight factor,  $\psi$ , which is varied within a range of values. Consequently, the value of the effective objective function could indeed be optimized, as recited in independent claim 1, to obtain operational decisions for the operational variables.

Assertion C: How the weighting factors,  $\psi$ , would affect the primary objective function,  $\Pi$ . The fourth Office Action asserts that the value of the primary objective function or the value of  $\Pi$ , does not depend on either (1) the value of the weighting factors,  $\psi$ , or (2) a variable value for the variables Q, P, and C which for any item "i" allegedly do not vary. As discussed above the variables do indeed vary.

Moreover, the weighting factors,  $\psi$ , can affect the primary objective function,  $\Pi$ . Appellant's disclosure teaches of optimizing the effective objective function,  $\Pi_{\text{eff}}$ , with respect to all of the operational variables,  $\{X_i\}$ , for one of the weighting factors,  $\psi$ , for the constraint function (paragraphs [0113] through [0115]). Optimization is then repeated over a selected range of weighting factors from  $\psi^{\text{min}}$  to  $\psi^{\text{max}}$  (paragraph [0118]). The result of each optimization is the optimized value of the effective objective function,  $\Pi_{\text{eff}}$ , and the resulting values for the independent/operational variables,  $\{X_i\}$ . The values of the primary objective function,  $\Pi$ , and the constraint function,  $\phi$ , are determined from these variables,  $\{X_i\}$ , and are stored in a Constraint Overview table (paragraph [0117]). Since the value of the primary objective function,  $\Pi$ , is determined from the variables,  $\{X_i\}$ , arrived at through the optimization of

the effective objective function, and since the effective objective function is constructed to include a weighting factor,  $\psi$ , the value of the primary objective function does depend on the value of the weighting factor, despite Office Action allegations to the contrary.

Assertion D: How a graphical view of the dollar value of the primary objective function versus the dollar value of the constraint function for each weighting factor could be used to manage an enterprise since "the value of  $\Pi$  does not depend on the value of  $\psi$  and there are many different combinations of the values of  $Q$ ,  $P$  and  $C$  which for any item "i" that would produce the same resultant value for  $\Pi$ ." The reasoning of Assertion D set forth in the fourth Office Action corresponds with that of Assertions B and C. However, as discussed above, the value of the primary objective function  $\Pi$  does depend on the value of the weighting factor  $\psi$ , and the operational variables  $\{X_i\}$  can vary to produce differing resultant values for the primary objective function.

Appellant discusses at length the benefits of a graphical view of the relationship between outcomes of the primary objective function (representing a primary goal of an enterprise) versus values of the constraint function (representing a strategic constraint) corresponding to the weighting factors, and how this graphical view can be used to manage an enterprise. Previous to the present invention there had been no way for a manager to easily visualize the effect a strategic goal/constraint may have on a primary goal of an enterprise, or the tradeoffs involved in setting different strategic goals/constraints.

The invention of claim 1 allows optimization of the selected operational decisions in view of a strategic constraint, and presents the results in a graphical view so that the optimum decision envelope can be visualized for the selected primary goal in light of the selected strategic constraint (paragraph [0027]). The graphical view helps a manager to manage an enterprise by allowing the manager to see the tradeoffs involved with the selected strategic constraint so that the manager has advance knowledge of the cost of the strategic constraint.

For the reasons set forth above, Appellant believes that the language of independent claim 1 circumscribes the subject matter with a reasonable degree of clarity and particularity. Moreover, when claim 1 is read in light of the disclosure, the claim reasonably apprises one skilled in the art of the use and scope of the invention. Thus, Appellant believes that independent claim 1 is definite. Accordingly, the Board is respectfully requested to reconsider independent claim 1.

#### **Claims 3-7**

While the previous discussion was specifically directed to independent claim 1, the limitations of claim 1 are read into dependent claims 3-7. Accordingly, the previous discussion applies equally to claims 3-7, and claims 3-7 are believed to be definite and allowable by reason of dependency. Accordingly, the Board is respectfully requested to reconsider claims 3-7.

Grounds of Rejection 2 -- Claims 1 and 3-7 as being directed to  
non-statutory subject matter

Regarding independent claim 1, Section 6.1.3 of the fourth Office Action acknowledges that claims 1 and 3-7 recite a method comprising a series of steps to be performed which has a disclosed practical application in the technological or useful arts. The fourth Office Action further acknowledges that the claims do not merely define either a computer program, a data structure, non-functional descriptive material, (i.e. mere data) or a natural phenomenon.

The following sections of the fourth Office Action seemingly contradict Section 6.1.3. For example, Section 6.1.4 of the fourth Office Action asserts that the process of the claims does not produce a useful concrete and tangible result that is a concrete and tangible application within the technological or useful arts. Section 6.1.5 further asserts that Appellant has not recited in the claims a specific process, machine, manufacture, or composition of matter, or any new and useful improvement thereof which is either A) altered, changed, or modified by the invention recited in the claims, B) utilizes the result of the invention recited in the claims, or C) is operated or controlled by the result of the invention recited in the claims. Section 6.1.6 again alleges that the claimed invention is without a claimed concrete and tangible practical application of an abstract idea. Section 6.1.7 also further notes that the type/nature of either the data or the calculated numbers does not affect the operation of the claimed invention and hence are considered to be non-functional descriptive material. Section 6.1.9 summarizes with the assertion that the claims, as a whole,



are directed to a hypothetical mental exercise that merely manipulates mathematics or an abstract idea without a claimed concrete and tangible practical application of the mathematics or abstract idea, and hence are directed to non-statutory subject matter.

The invention of independent claim 1 incorporates technology, i.e., a computer program executable by a processor, and presents a graphical view of a plurality of outcomes of the primary objective function versus values of the constraint function corresponding to the weighting value. The operation of presenting a graphical view of a plurality of outcomes of the primary objective function versus values of the constraint function corresponding to the weighting value constitutes a practical application because it produces a "concrete and tangible result" - the ability to visualize the effects of the strategic constraint on the primary goal.

Since the claimed subject matter is "tangible and concrete," focus can then be directed towards its practical usefulness. The specification sets forth reasons that explain why the invention is believed useful. As discussed in detail in the Background of the Invention section of Appellant's specification, a problem with the use of model-based decision-making tools is the operational decisions that are recommended by the model may begin to deviate from broader considerations that are not specifically built into the enterprise planning model. That is, an ordinary enterprise model cannot combine optimization of enterprise decisions/primary goals of an enterprise with the strategic objectives/constraints of the enterprise. Consequently, the model's utility is greatly

impacted. This inability to align and optimize an enterprise's operational decisions with its strategic objectives results in billion-dollar pricing inefficiencies in the retailing industry alone.

Accordingly, Applicant's invention of claim 1 enables combination of a primary objective function representing a primary goal of an enterprise with a constraint function representing a strategic constraint into an effective objective function. The effective objective function is optimized over a range of weighting factors for the constraint function to obtain operational decisions for operational variables, and a plurality of outcomes of the primary objective function are determined in response to the range of weighting factors. The outcomes of the primary objective function versus values of the constraint function corresponding to the weighting factors are presented in a graphical view. This graphical view exemplifies the dependence of the primary goal on the strategic constraint.

By visualizing this dependence, the manager has advance knowledge of an effect that the strategic constraint might have on the primary goal. This advance knowledge has practical usefulness in that it allows the user to see the tradeoffs involved in setting different strategic constraints when managing the enterprise (paragraph [0027]), with the idea that the selected tradeoff will actually produce a benefit in the long run. An enterprise planning model, into which the invention of claim 1 is incorporated, is thus a highly useful tool for facilitating the selection of a strategy based on visualizing the effect or cost of such a strategy. However, the actual strategic planning and its implications, i.e., managing

an enterprise, depend on the skill and the knowledge of the manager.

Appellant's invention of claim 1 constitutes a practical application because it produces a useful, concrete and tangible result. The useful result is the ability to visualize the tradeoffs involved in setting different strategic constraints when managing the enterprise. Consequently, Applicant's invention of claim 1 is indeed drawn toward statutory subject matter. Accordingly, the Board is respectfully requested to reconsider independent claim 1.

#### **Claims 3-7**

While the previous discussion was specifically directed to independent claim 1, the limitations of claim 1 are read into dependent claims 3-7. Accordingly, the previous discussion applies equally to claims 3-7, and claims 3-7 are believed to be directed to statutory subject matter and are allowable by reason of dependency. Accordingly, the Board is respectfully requested to reconsider claims 3-7.

#### **Ground of Objection -- Disclosure**

The fourth Office Action objected to the disclosure because of the following informalities:

A) applicant must update the continuing data on page 1 with the current status of each of the referenced applications; and

B) applicant has used the letter  $\phi$  inconsistently.

C) the formula used for "price index" as presented in paragraph [0014] is later inconsistently identified as the formula used for the "price image" indicated in paragraph [0099].

Regarding item A), the continuing data on page 1 of this Continuation application was updated in the first Amendment. To date, this status remains unchanged. Accordingly, no correction to paragraph [0001] is required.

Regarding item B), the letter  $\phi$  is used to generally symbolize a constraint function that represents a strategic constraint/objective. In paragraph [0014] an exemplary strategic constraint/objective is Price Index. However, in paragraph [0099], an exemplary strategic constraint/objective is Price Image. The same symbol  $\phi$  used in both of these paragraphs merely indicates that the associated formulas represent strategic constraints/objectives. Price Image and Price Index are only two examples of strategic constraints/objectives set forth in Appellant's disclosure. Other strategic constraints/objectives are also taught, such as service time, risk, product availability, product selection, market share, revenue, and so forth (paragraphs [0014] through [0024]). Since the symbol  $\phi$  is used to generally symbolize a constraint function that represents a strategic constraint/objective, this same symbol  $\phi$  may be utilized for other constraint functions representing the aforementioned strategic constraints.

As best understood, the fourth Office Action fails to understand distinctions between the symbols  $\phi^{\text{targ}}$ ,  $\phi_i^{\text{bound}}$ ,  $\phi$ ,  $\phi_i$ , and  $\phi_j$  utilized in Appellant's specification. As discussed

above,  $\phi$  symbolizes a constraint function that represents a strategic constraint/objective. The symbol  $\phi^{\text{targ}}$  represents a target value for a constraint function (paragraphs [0147] through [0149]) within a constraint overview table. The symbol  $\phi_i^{\text{bound}}$  represents a list of entries from the constraint overview table that correspond to the bounds (denoted as  $\psi^{\text{low}}$  and  $\psi^{\text{high}}$ , for the lower and upper bounds, respectively) on the constraint target  $\phi^{\text{targ}}$  (paragraph [0151]). The symbol  $\phi_i$  represents a set of constraint functions, one for each strategic constraint/objective for those situations in which there is more than one strategic objective/constraint to be applied simultaneously (paragraph [0161]). Each of the symbols  $\phi^{\text{targ}}$ ,  $\phi_i^{\text{bound}}$ ,  $\phi$ , and  $\phi_i$  relate to the strategic constraint, thus they are used consistently. In addition, they are all distinguishable from one another within the context of the specification, as set forth above, and require no correction.

The symbol  $\phi_j$  relates to the multiple strategic constraint implementation and is utilized interchangeably with the symbol  $\phi_i$  (paragraphs [0161] through [0163]). This is an immaterial inconsistency readily detectable by one skilled in the art. Moreover, the multiple strategic constraint implementation is from an unclaimed portion of the specification. Thus, such an inconsistency does not require correction in order for one skilled in the art to practice the claimed invention.

The fourth Office Action asserts that the letter  $\phi$  "has" a first equation and the letter  $\phi$  "has" a second equation that is different from the first equation. The fourth Office Action then asserts that it is unclear which of these equations is used

in the effective objective function.

The particular function  $\phi$  used can be either of the functions, or another undisclosed function  $\phi$  used to represent another strategic constraint/objective. Indeed, it is not crucial as to which specific constraint function is utilized in the effective objective function. Rather, advantage lies with the ability to represent a strategic constraint by a constraint function and combine the constraint function with a primary objective function. Through this representation and inclusion in an effective objective function, a manager can consider one or more tradeoffs that the manager may choose to take, with the idea that the tradeoff will actually produce a benefit in the long run. Since the constraint function can take on a number of forms, a modification to the disclosure to specify which of two particular equations is used in the effective objective function is not required.

Regarding item C) of the concern raised that the formula used for price index in paragraph [0014] is inconsistently identified as the formula for price image in paragraph [0099]. Price index and price image are closely related. Price index can be expressed as a direct mathematical comparison between a retailer's prices and that of a competitor. Similarly, price image can be expressed as a mathematical function of all the prices in the market. However, since no particular constraint function is specified in the claims and the terms price image and price index are not utilized within the claims, Appellant believes that no correction to the specification is required.

### Conclusion

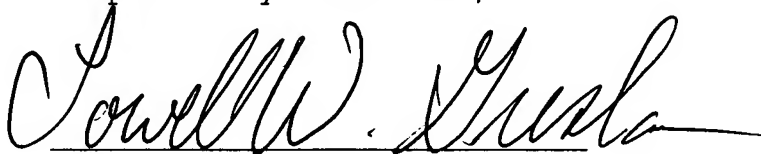
Claims 1 and 3-7 are included in this Appeal.

The rejection of claims 1 and 3-7 under 35 U.S.C. §112, second paragraph, is believed to be improper because when the claims are read in light of the supporting specification, they reasonably apprise one skilled in the art of the use and scope of the invention. In addition, the language of the claims circumscribes the subject matter with a reasonable degree of clarity and particularity. As such, the claims are definite under U.S.C. §112, second paragraph. The rejection of claims 1 and 3-7 under 35 U.S.C. §101 is also believed to be improper because the claims incorporate technology, i.e., a computer program in an enterprise planning model that calculates a plurality of outcomes and presents the results in a graphical view. This real-world result, a graphical view of outcomes of the primary objective function of an enterprise planning model versus values of the constraint function arrived at through optimization of the effective objective function yields operational decisions that take into account both a primary goal and a strategic constraint. This intuitive graphical view exemplifies the dependence of the primary goal on the strategic constraint so that the manager has advance knowledge of an effect that the strategic constraint might have on the primary goal. This advance knowledge has a concrete and tangible application in that it allows the user to see the tradeoffs involved in setting different strategic constraints when managing the enterprise. An enterprise planning model, into which the present invention is incorporated, is thus a highly useful tool for facilitating the selection of a strategy based

on visualizing the effect or cost of such a strategy.  
Furthermore, no correction to the specification is necessary.

Appellant believes that the arguments above fully respond to every outstanding ground of rejection and that the contested claims should be found allowable.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Lowell W. Gresham', written over a horizontal line.

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APPELLANT'S BRIEF  
Serial No. 10/633,249  
Page A-1



## Appendix A -- Claims on Appeal

This Appendix is four pages, including this cover page, and contains a clean double-spaced copy of the claims on appeal.

Claim 1. In an enterprise planning model, a computer program residing in memory and executable by a processor, said computer program enabling visualization of an effect of a strategic constraint on a primary goal of an enterprise, said computer program instructing said processor to perform operations comprising:

selecting said primary goal of said enterprise planning model, said primary goal being represented by a primary objective function, said primary objective function depending upon a set of operational variables;

representing said strategic constraint by a constraint function, said constraint function depending upon a subset of said operational variables;

constructing an effective objective function by combining said primary objective function and said constraint function;

optimizing said effective objective function over a range of weighting factors for said constraint function to obtain operational decisions for said operational variables, said optimizing operation optimizing said effective objective function for each of said weighting factors in said range;

determining, from said optimizing operation, a plurality of outcomes of said primary objective function in response to said range of weighting factors; and

presenting a graphical view of said plurality of outcomes of said primary objective function versus values of said constraint function corresponding to said weighting factors such that effects of said strategic constraint on said primary goal can be readily perceived by a user to manage said enterprise.

Claim 3. A computer program as claimed in claim 1 wherein said computer program instructs said processor to perform further operations comprising:

selecting a set of scenarios for said strategic constraint;  
and

for each of said set of said scenarios, providing a set of said operational decisions for said operational variables that optimize said primary goal while concurrently satisfying said strategic constraint.

Claim 4. A computer program as claimed in claim 3 wherein said computer program instructs said processor to perform further operations comprising:

enabling said user to target one of said scenarios from said set of said scenarios to be realized within said enterprise; and

providing said set of said operational decisions associated with said one of said scenarios to said user.

Claim 5. A computer program as claimed in claim 1 wherein said computer program instructs said processor to perform a further operation of said optimizing operation comprising:

outputting said operational decisions for said set of operational variables that optimize said objective function while concurrently satisfying target values for said constraint function.

Claim 6. A computer program as claimed in claim 1 wherein said computer program instructs said processor to perform a further operation of said optimizing operation comprising selecting said range of weighting factors for said constraint function, said weighting factors adjusting an effect that said constraint function has on said objective function.

Claim 7. A computer program as claimed in 1 wherein:  
said primary goal is limited by physical constraints of said enterprise planning model; and  
said strategic constraint is non-limited by said physical constraints of said enterprise planning model.



Appendix B -- Figures

This Appendix is sixteen pages, including this cover page, and contains drawing sheets 1-15 containing a clean copy of each of Figures 1-16.

For the convenience of the Board, the drawing pages in this Appendix have been reduced slightly to reside in the site of this document.

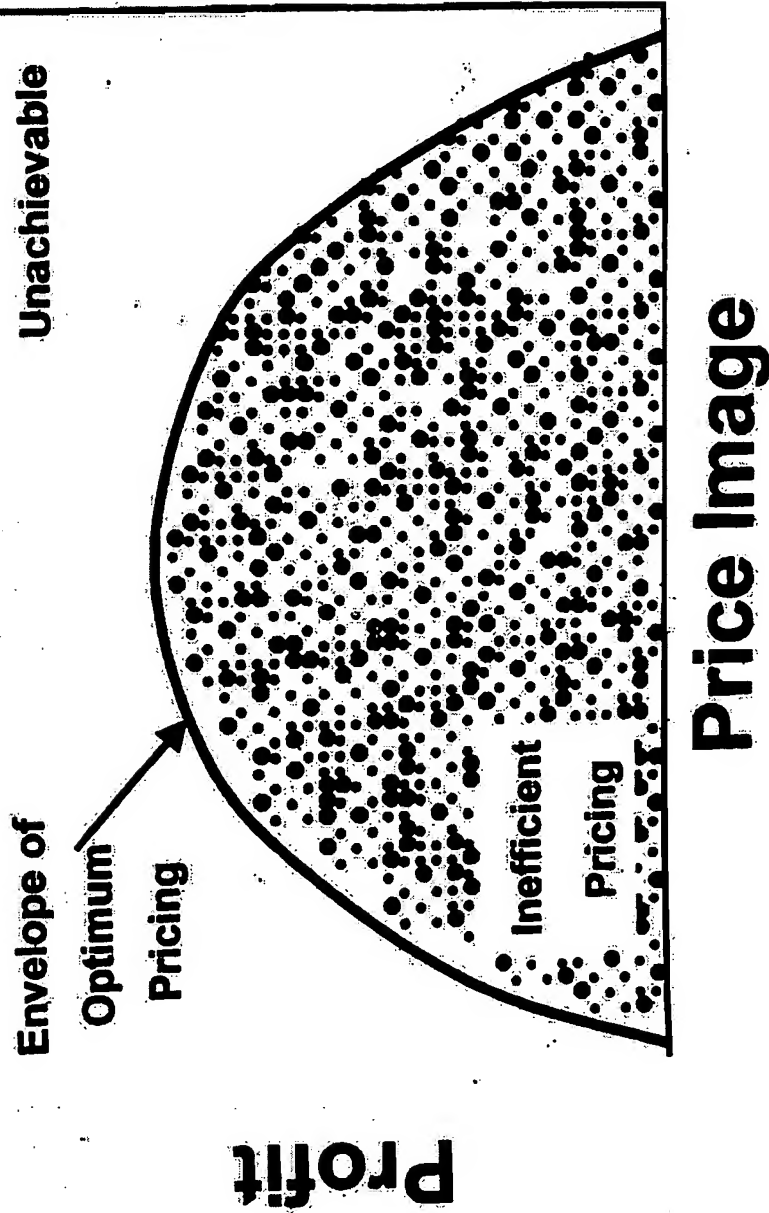


Figure 1

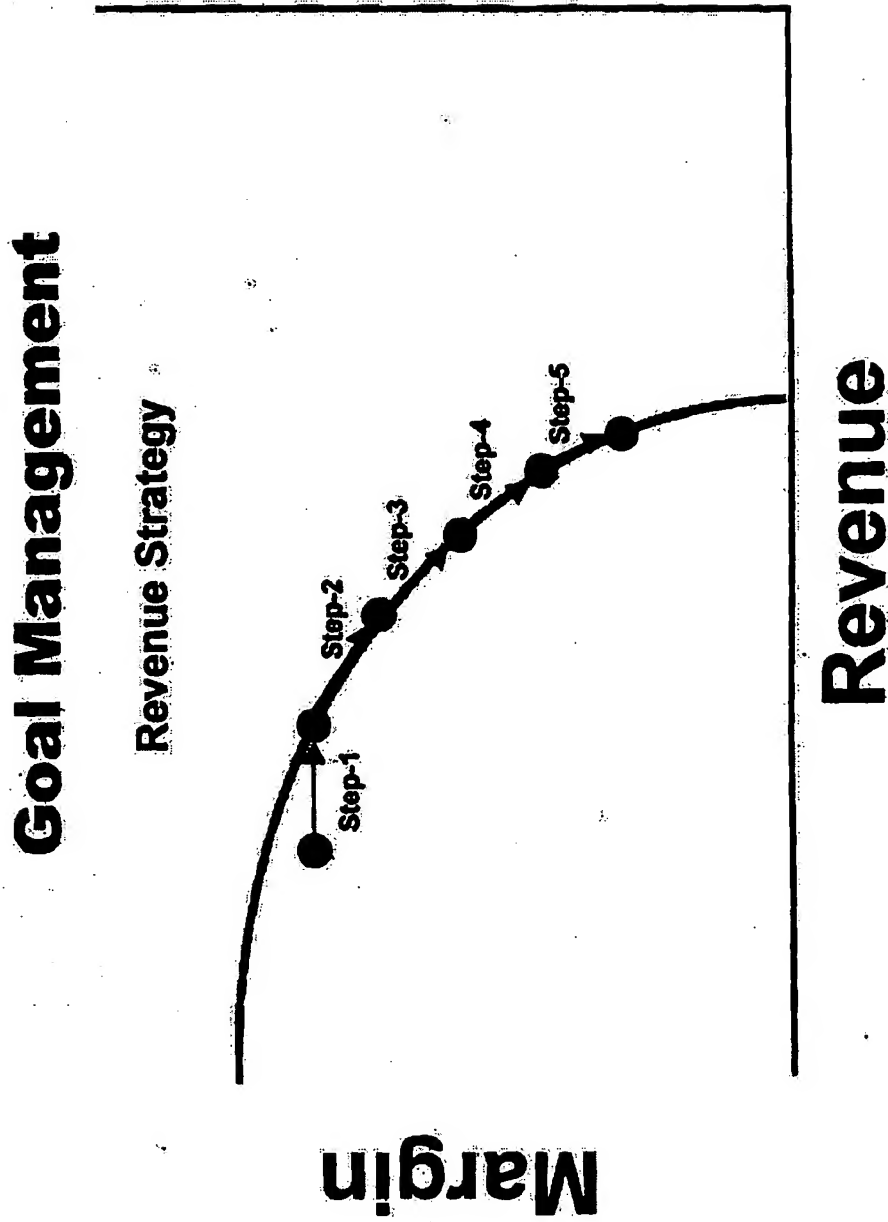
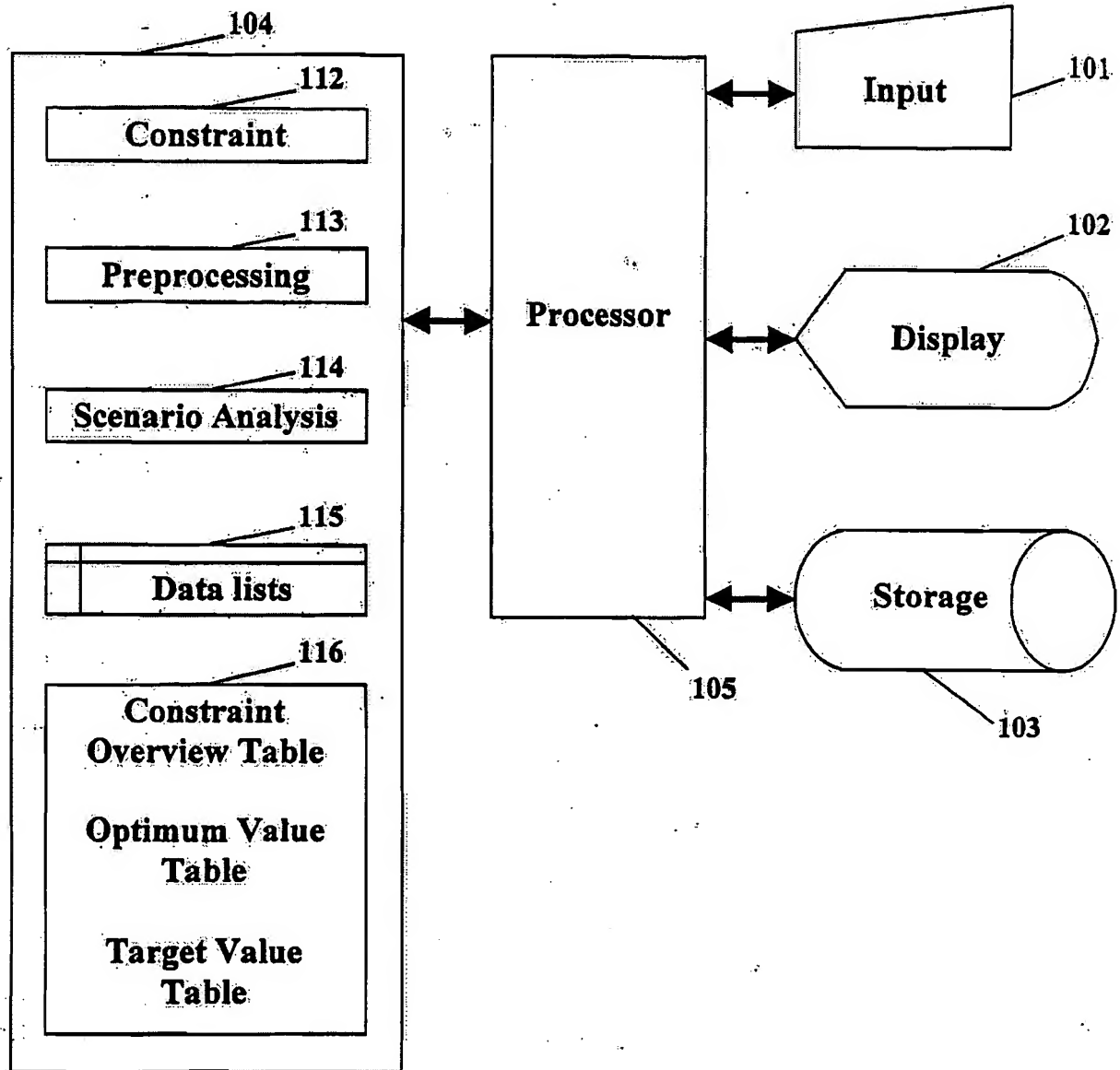
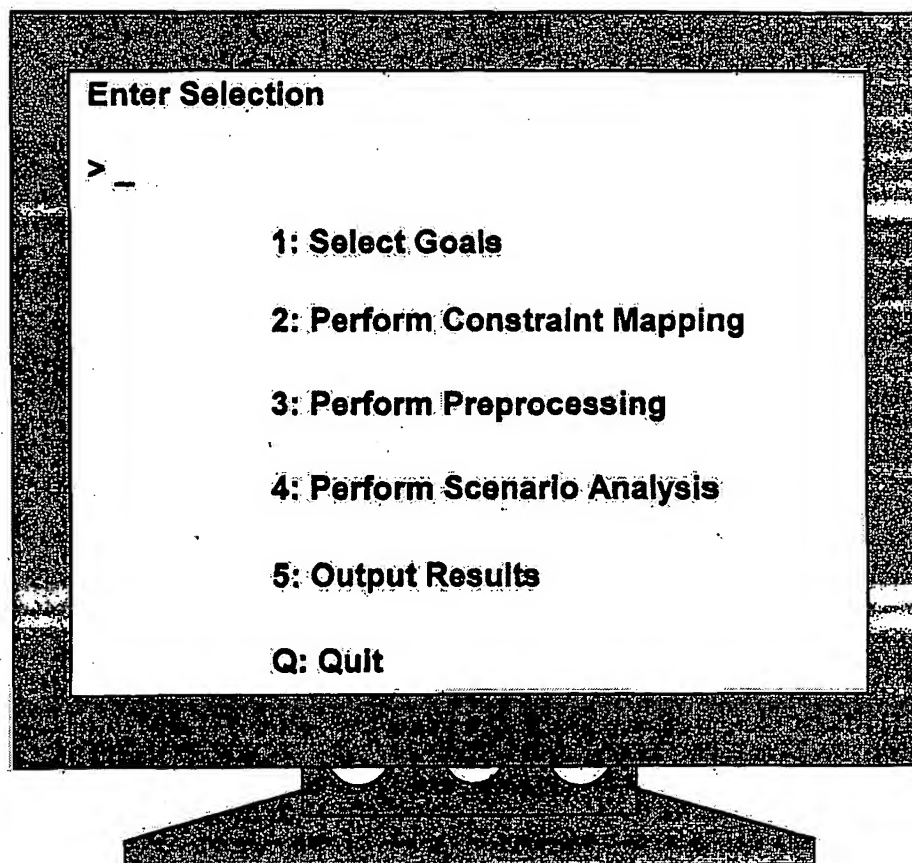


Figure 2

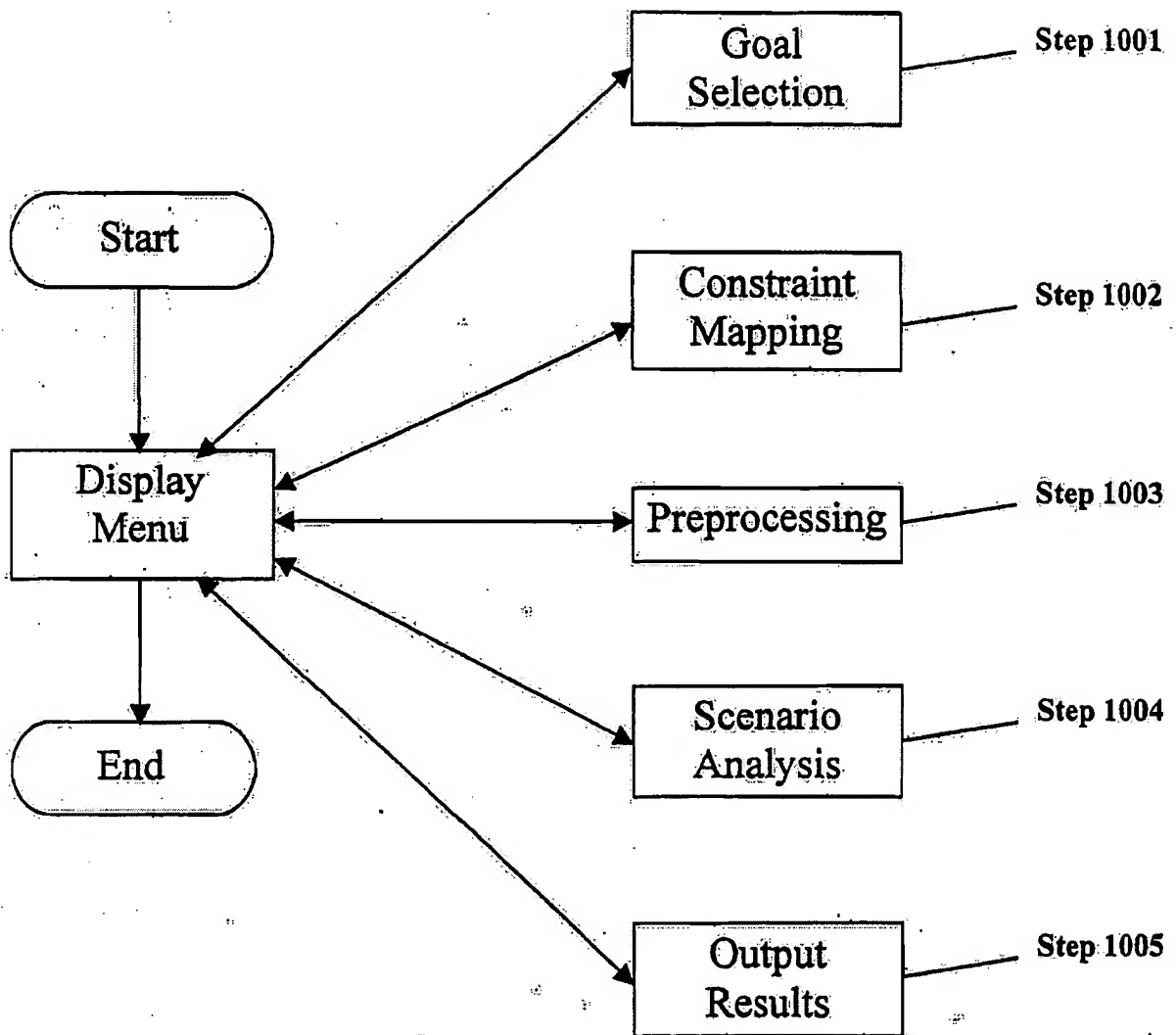


**Figure 3**

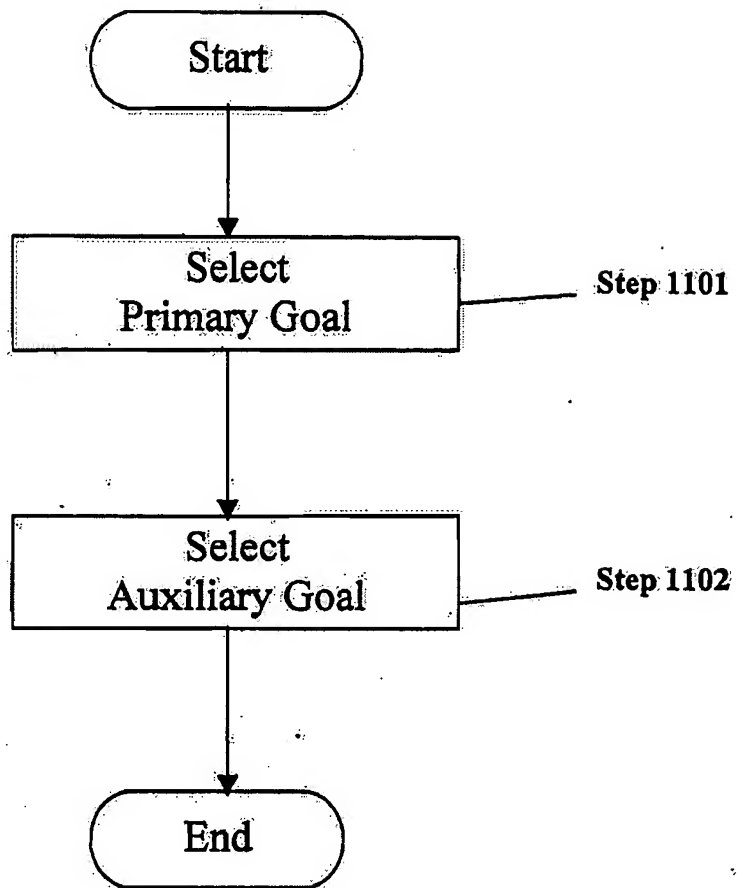




**Figure 4**



**Figure 5**



**Figure 6**

**Select Goals**

>\_

**Select Primary Goal**

**1. Select Predefined Primary Goal**

**a. Maximize Gross Profits:**

$$\Pi = \sum Q_i(P_i - C_i)$$

**b. Maximize Total Sales:**

$$\Pi = \sum Q_i P_i$$

**2. Define New Primary Goal**

**Select Auxiliary Goal**

**3. Select Predefined Auxiliary Goal**

**c. Maintain Overall Price Image:**

$$\phi = \frac{1}{N} \sum_{i=1}^N \frac{P_i}{P_t} \times w_i,$$

**4. Define New Auxiliary Goal**

**Q. Return to Main Menu**

**Figure 7**

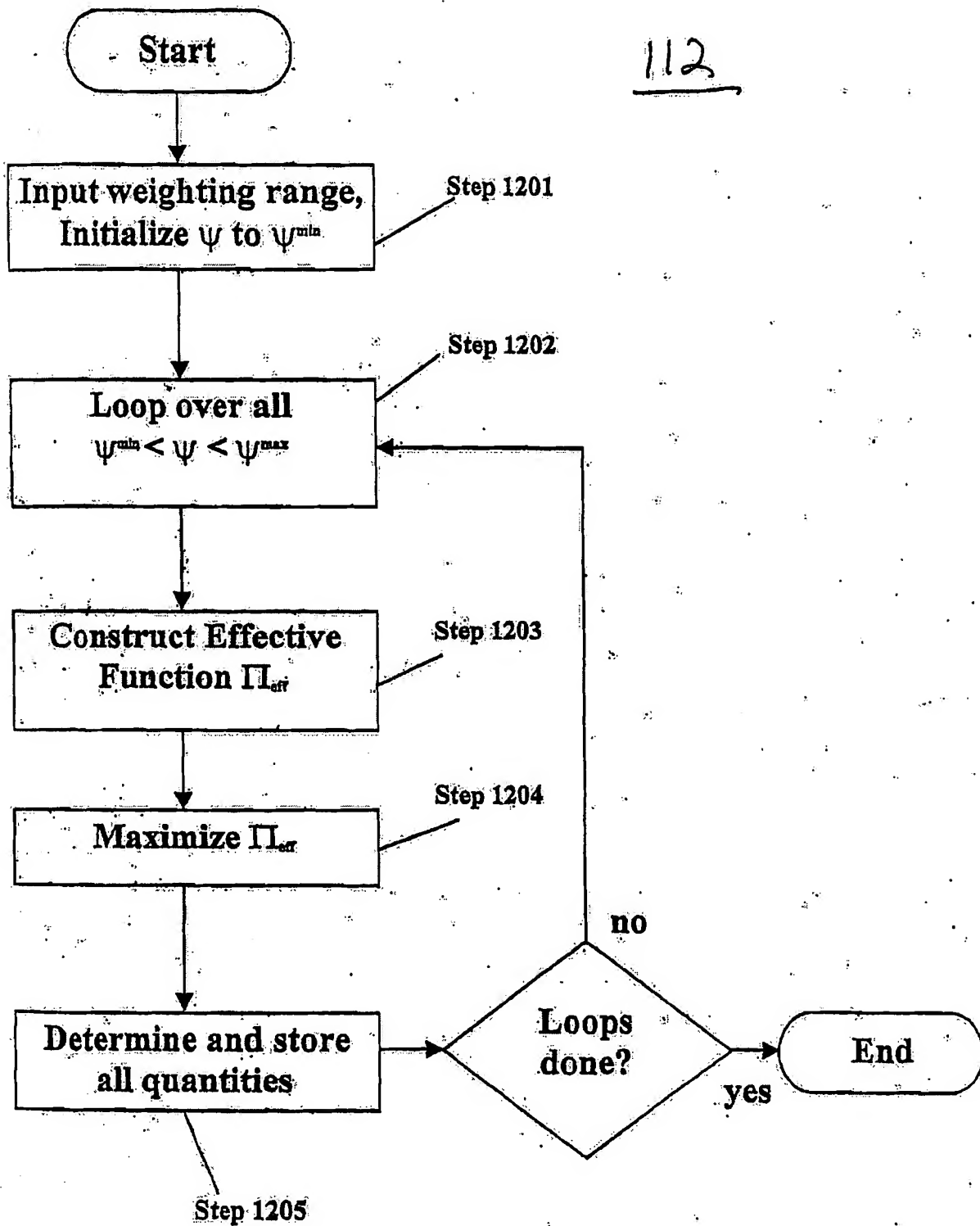


Figure 8

$\Psi$	$\Pi$	$\phi$
1	\$10,000	0
2	\$11,000	1
3	\$12,000	2
4	\$13,000	3
5	\$14,000	2
6	\$15,000	1
7	\$16,000	2
8	\$17,000	3

**Constraint Overview Table**

$\phi^{avg}$	$\Psi^{high}$	$\Psi^{low}$
0.5	1	2
2.5	3	4
2.5	4	5
3.5	NULL	NULL

$\{\phi^{bound}\}$

**Figure 9**

**Enter Weighting Range**

>\_

- 1. Select Minimum Value:  $\psi^{\min}$**
- 2. Select Maximum Value:  $\psi^{\max}$**
- 3. Select Resolution:  $\delta\psi$**
- 4. Continue Constraint Mapping Routine**

**Figure 10**

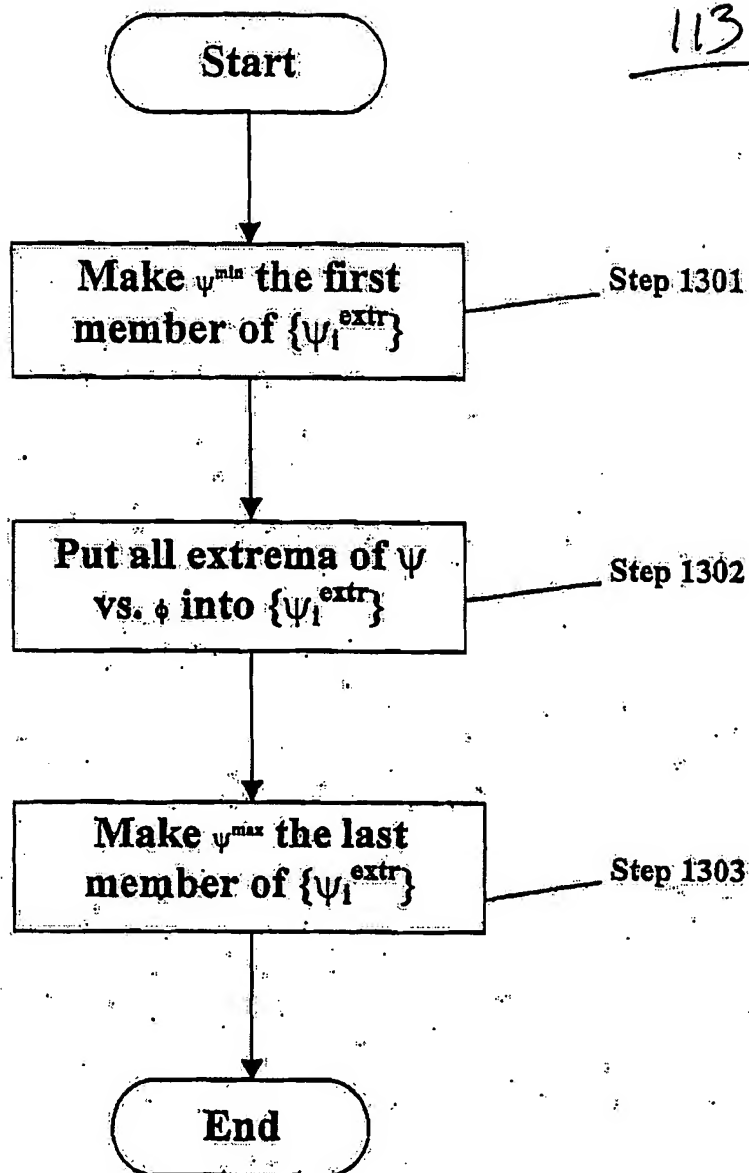


Figure 11



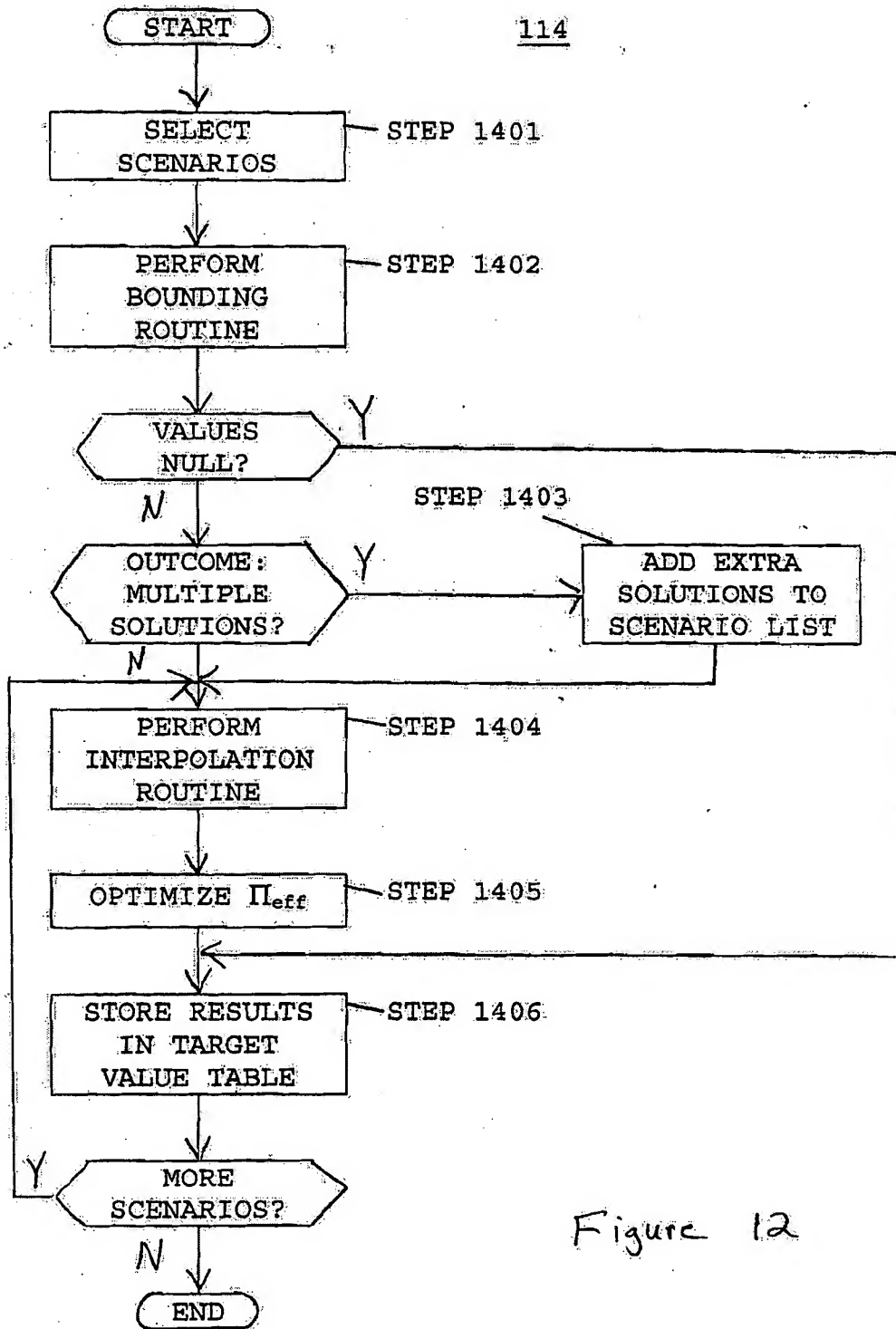


Figure 12

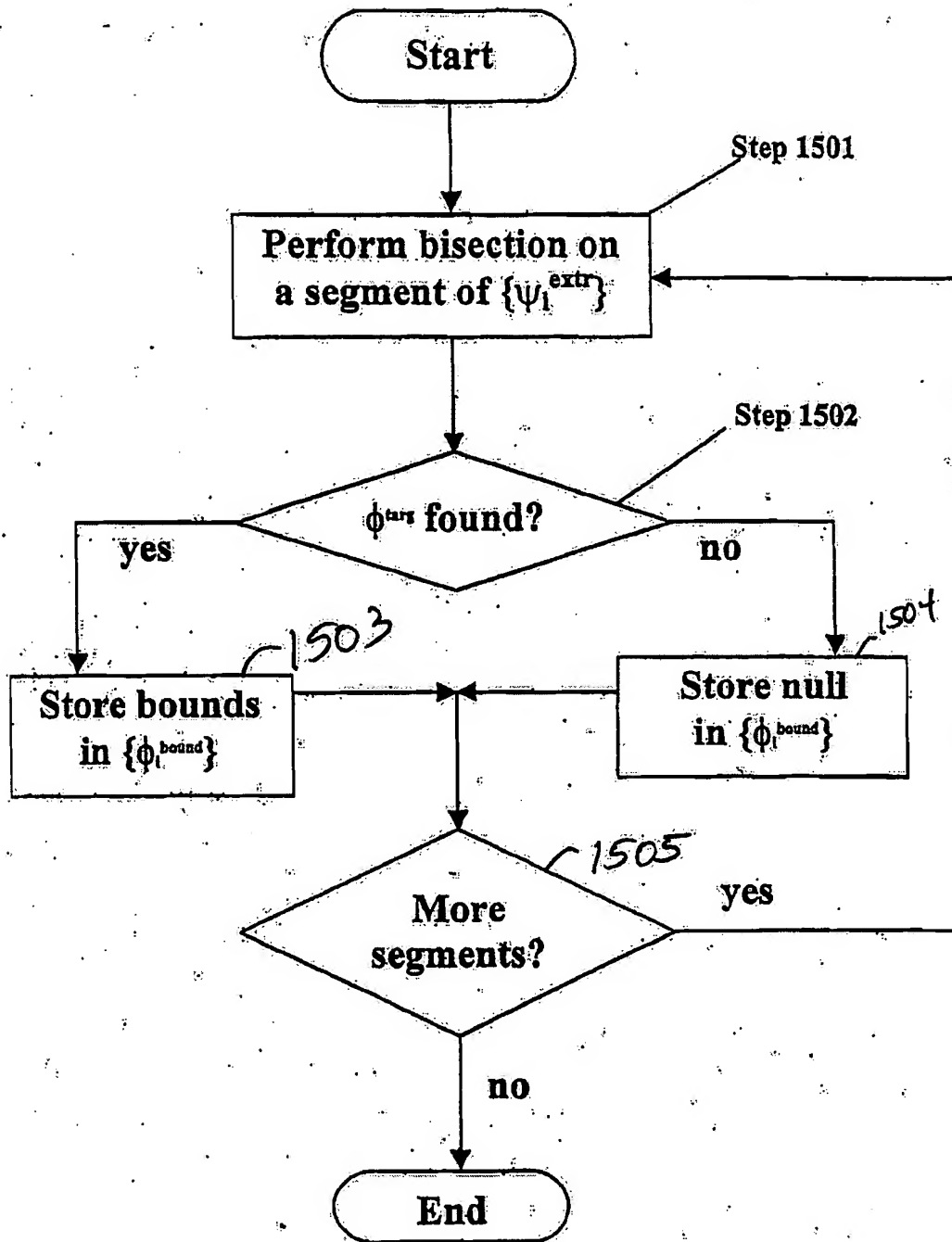
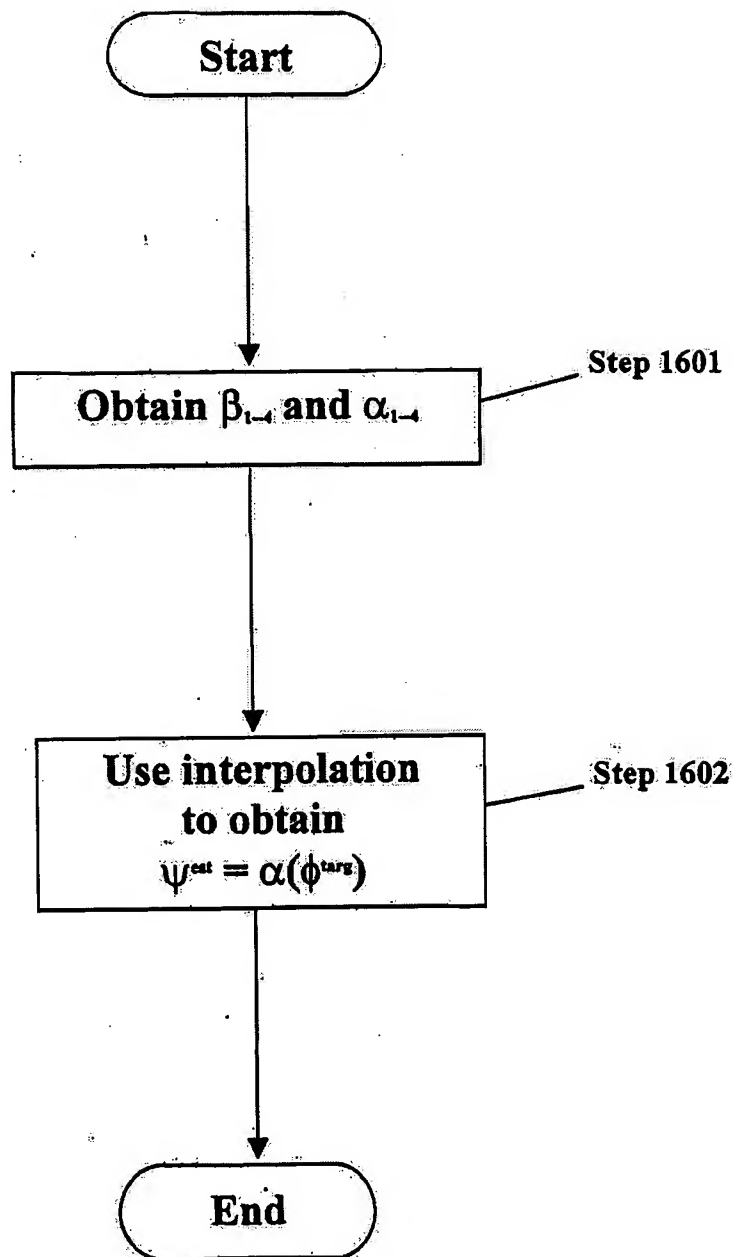


Figure 13



**Figure 14**

Constraint Overview Table	
...	...
$\psi = \alpha_1$	$\phi = \beta_1$
$\psi = \alpha_2$	$\phi^{\text{low}} = \beta_2$
$\phi^{\text{low}} < \phi^{\text{target}} < \phi^{\text{high}}$	
$\psi = \alpha_3$	$\phi^{\text{high}} = \beta_3$
$\psi = \alpha_4$	$\phi = \beta_4$
...	...

Figure 15

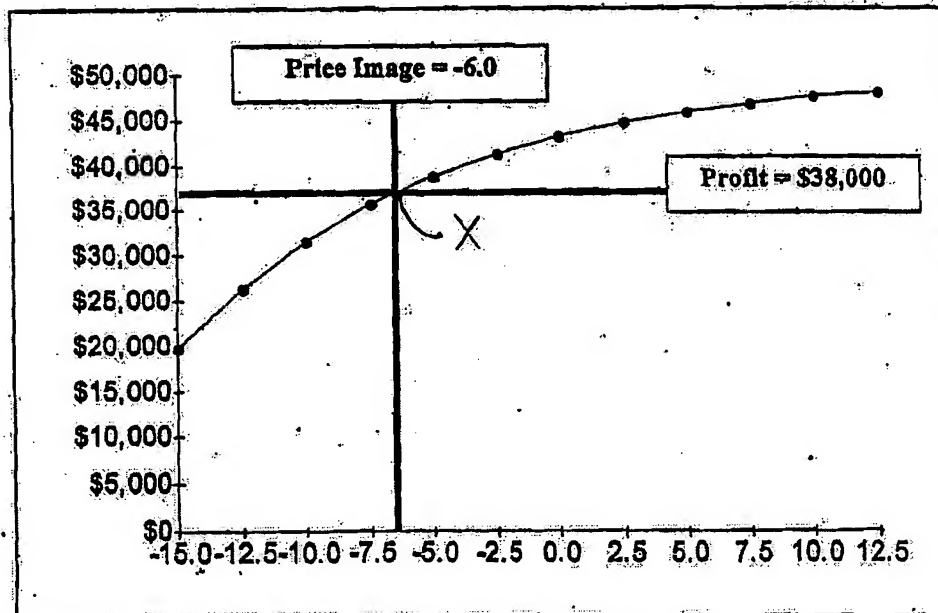


Figure 16

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